(12) UK Patent Application (19) GB (11) 2 331 890 (13) A

(43) Date of A Publication 02.06.1999

(21) Application No 9825377.6

(22) Date of Filing 19.11.1998

(30) Priority Data
(31) 09318448 (32) 19.11.1997 (33) JP

(71) Applicant(s)
NEC Corporation
(Incorporated in Japan)
7-1 Shiba 5-chome, Minato-ku, Tokyo, Japan

(72) Inventor(s)
Shigeru Kurosawa

(74) Agent and/or Address for Service
Mathys & Squire
100 Grays Inn Road, LONDON, WC1X 8AL,
United Kingdom

(51) INT CL^6
H04M 1/274 1/57

(52) UK CL (Edition Q)
H4K KBNJ

(56) Documents Cited
EP 0463582 A2   WO 98/27706 A1

(58) Field of Search
UK CL (Edition Q) H4K KBNJ
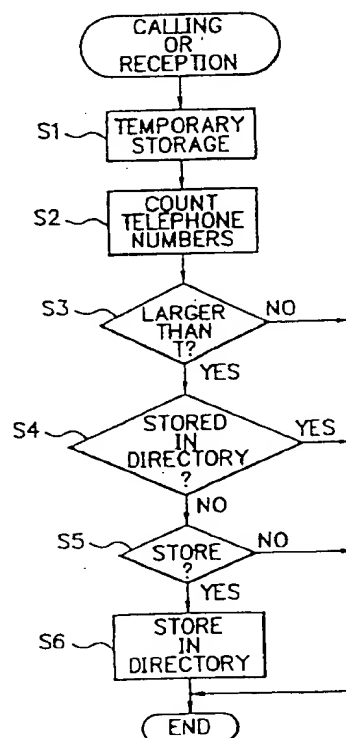INT CL^6 H04M 1/274 1/57
On-Line - WPI, EPODOC, PAJ

(54) Abstract Title
Storing frequently used telephone numbers

(57) Telephone numbers of outgoing calls, as dialled by a user, and incoming calls, as obtained via, for example, caller line identification (CLI), are progressively stored, on a first-in-first-out (FIFO) basis, in a temporary storage section which can store a finite number of telephone numbers. When a telephone number is stored, the total number of occurrences of that telephone number in the temporary storage section is counted. In an alternative embodiment, when the current telephone number is already present in the temporary storage section, time stamps may be associated with it and the number of time stamps may then be counted. If the number of occurrences of the current telephone number, as stored in the temporary storage section, or the number of time stamps, is larger than a predetermined threshold number T and the current telephone number has not yet been stored in the directory storage section, the user is asked whether storage of the telephone number is required.
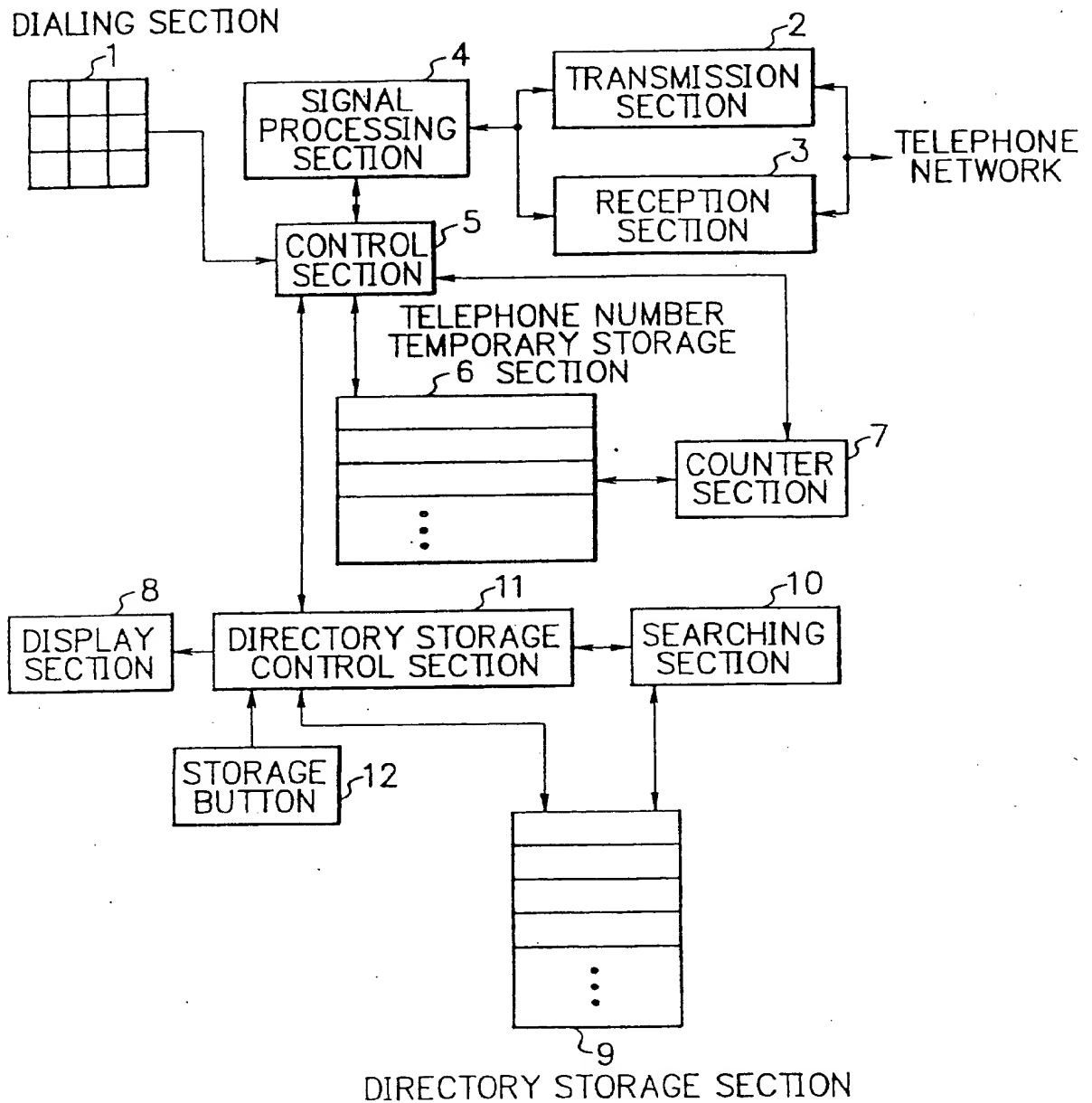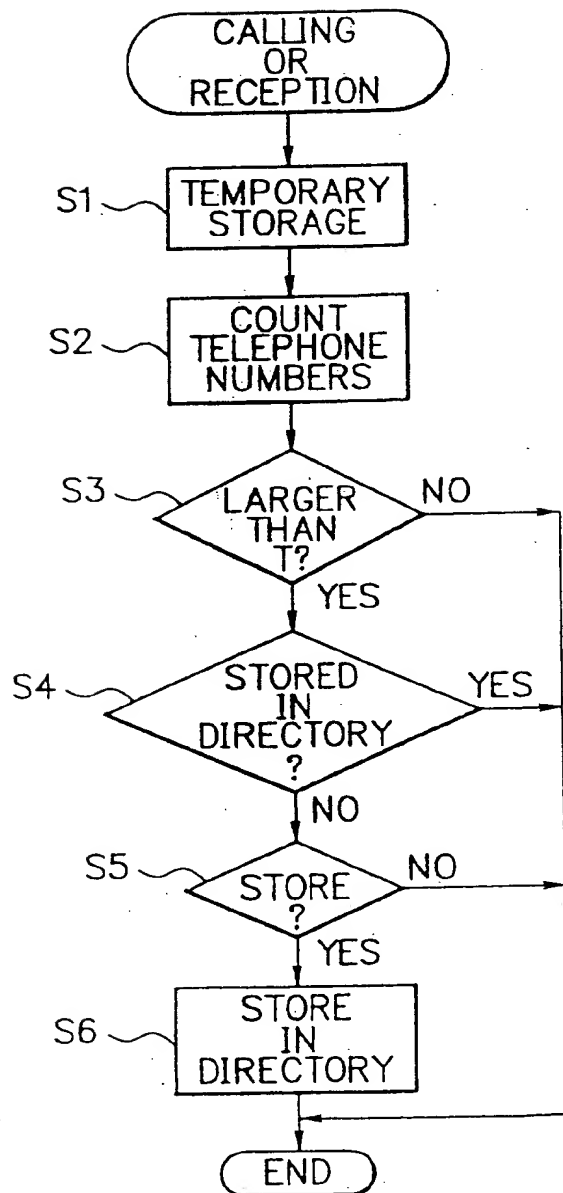
FIG. 2

GB 2 331 890 A

F I G. 1

DIALING SECTION

DIRECTORY STORAGE SECTION

F I G. 2

```
          ┌─────────────┐
          │   CALLING   │
          │     OR      │
          │  RECEPTION  │
          └─────────────┘
                 │
                 ▼
S1 ──┐   ┌─────────────┐
     └───│  TEMPORARY  │
         │   STORAGE   │
         └─────────────┘
                 │
                 ▼
S2 ──┐   ┌─────────────┐
     └───│    COUNT    │
         │  TELEPHONE  │
         │   NUMBERS   │
         └─────────────┘
                 │
                 ▼
S3 ──┐      ◇ LARGER ◇    NO
     └──────◇  THAN  ◇────────┐
            ◇   T?  ◇         │
                │ YES         │
                ▼             │
S4 ──┐     ◇ STORED ◇   YES   │
     └─────◇   IN   ◇─────────┤
           ◇DIRECTORY◇        │
           ◇   ?   ◇          │
                │ NO          │
                ▼             │
S5 ──┐     ◇ STORE ◇   NO     │
     └─────◇   ?   ◇──────────┤
                │ YES         │
                ▼             │
S6 ──┐   ┌─────────────┐      │
     └───│    STORE    │      │
         │     IN      │      │
         │  DIRECTORY  │      │
         └─────────────┘      │
                │             │
                ▼◄────────────┘
            ┌───────┐
            │  END  │
            └───────┘
```
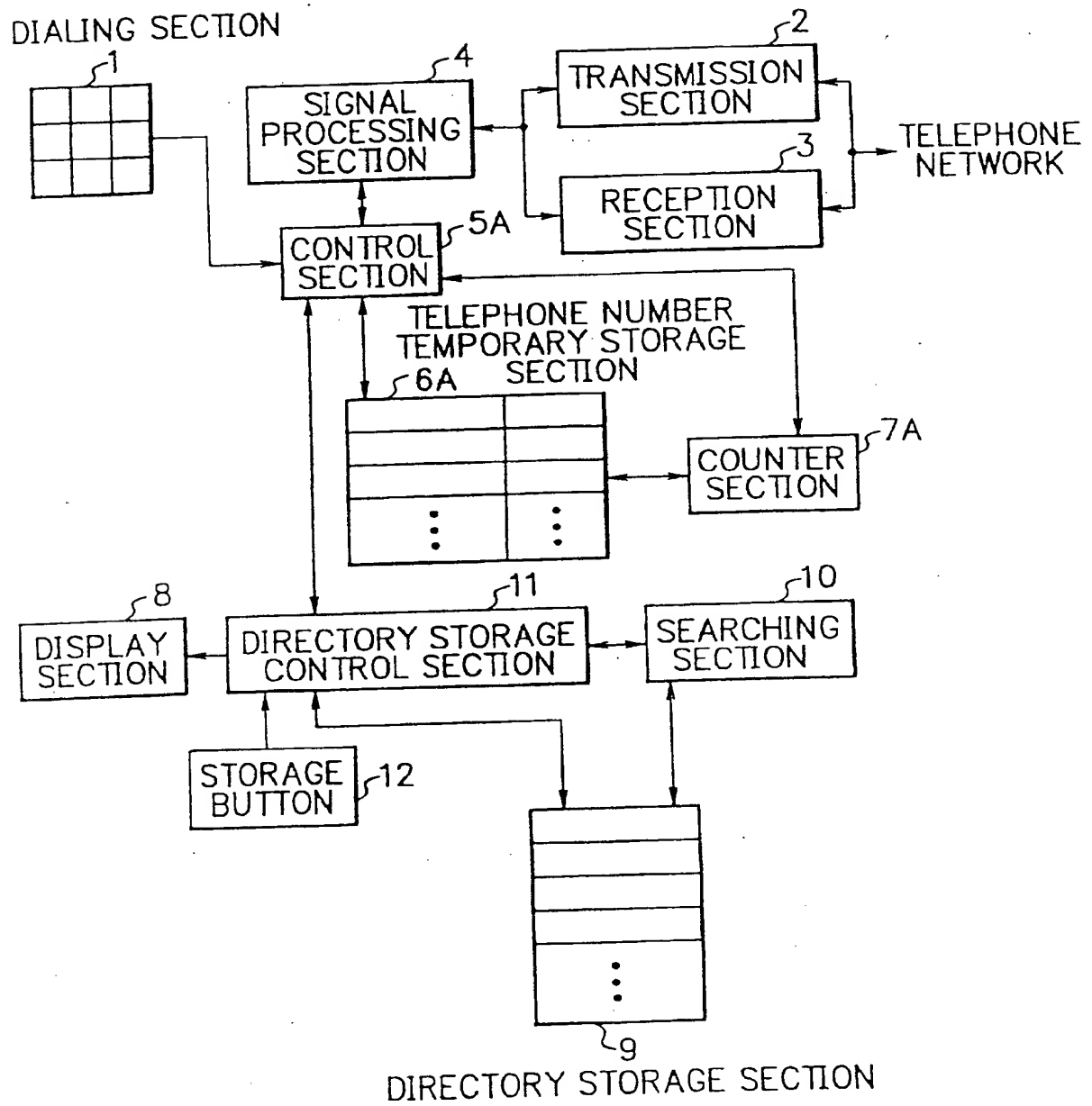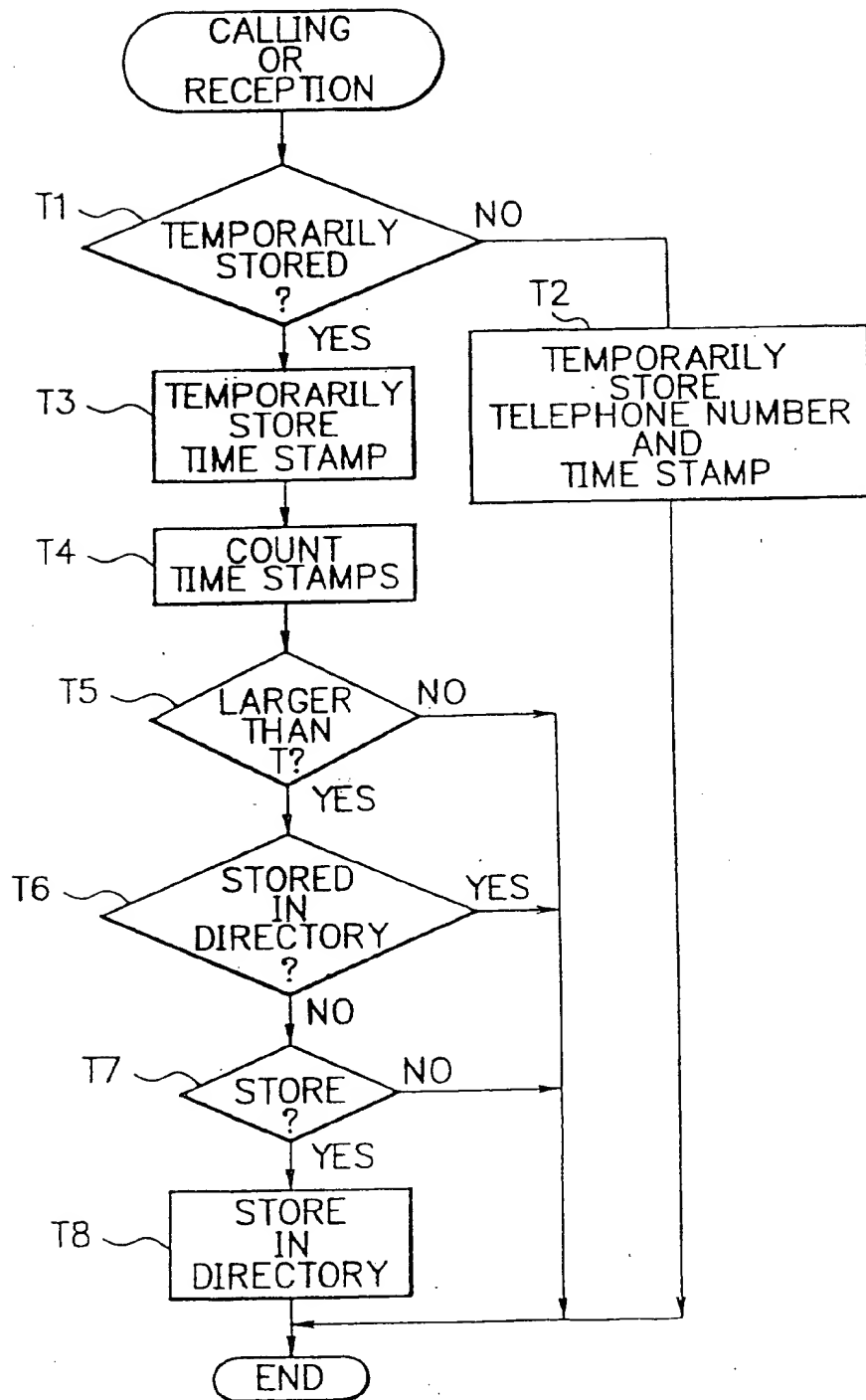
FIG. 3

DIALING SECTION

F I G. 4

DIRECTORY DIALING TELEPHONE SET

The present invention relates to a directory dialing telephone set which is provided with a directory for storing a plurality of telephone numbers and which has functions for executing calling or dialing of a

5 telephone number in a telephone network which has been stored in the directory.

These days, many of the telephone sets on the market are provided with functions for storing a plurality of telephone numbers in a directory

10 and executing dialing (calling) of a telephone number which has been stored in the directory (hereafter, such a telephone set will be referred to as a "directory dialing telephone set"). The user selects a telephone number from the directory and dials the selected telephone number with easy operation such as pushing one or more buttons.

15 When a telephone number should be registered in the directory of such a directory dialing telephone set, the user usually selects a registration mode of the telephone set, which is different from the ordinary mode for conversation, by pushing a button etc. Meanwhile, as disclosed in Japanese Patent Application Laid-Open No.SHO63-278451,

20 there has been proposed a directory dialing telephone set which is provided with functions for registering telephone numbers in its directory semi automatically. The telephone numbers which are registered by the directory dialing telephone set include telephone numbers which have been dialed by the user for calling and telephone numbers of calling

25 parties (i.e. calling numbers) which have been informed by the telephone network in services such as "calling number identification presentation" etc. The directory dialing telephone set inquires of the user whether or not the user intends to register the telephone number (i.e. the telephone

number which the user dialed or the telephone number of a calling party which has been informed by the telephone network) if the telephone number has not been registered in the directory yet. The inquiry is executed by the directory dialing telephone set on each telephone call

5   (calling and reception of a call), and the telephone number is registered in the directory if the user intended to register the telephone number and requested the registration by pushing a button etc.

However, such a directory dialing telephone set executes the inquiry depending on the result of the simple judgment on whether or not

10   the current telephone number (i.e. the telephone number which has just been dialed by the user for calling or the telephone number of a calling party which has just been informed by the telephone network) has already been registered in the directory, and thus the inquiry is executed even in the case where the telephone number is dialed by the user very

15   rarely (i.e. even in the case where it is almost clear that the telephone number will not be registered by the user), or even in the case where the user received a call from an undesired calling party.

As described above, conventional directory dialing telephone sets which are provided with functions for registering telephone numbers in

20   their directories require the user to spend time and execute some troublesome operation regardless of the priority of the telephone number.

SUMMARY OF THE INVENTION

It is therefore   an   object of the present invention to

25   provide a directory dialing telephone set provided with functions for registering telephone numbers in its directory, by which the user is released from the troublesome operation with regard to telephone numbers that will not be registered, for example, when the telephone number dialed by the user is a rarely used number, when the user

30   received a call from an undesired calling party, etc., and the user can

register necessary telephone numbers in the directory efficiently and with a minimum of effort.

In a first aspect, the present invention provides a directory dialing telephone set comprising directory storage means for storing a directory including a plurality of telephone numbers; means for executing dialing of a telephone number which has been selected by the user from the telephone numbers stored in the directory storage means;

telephone call frequency judgement means for judging the frequency of telephone calls made or received by the telephone set to or from a particular telephone number; and

directory storage control means for controlling storage of the telephone number in the directory storage means if the telephone number is not already stored therein and if the frequency of telephone calls to or from the telephone number is higher than a predetermined frequency.

In a preferred embodiment of the present invention, there is provided a directory dialing telephone set which is provided with a directory storage means for storing a directory including a plurality of telephone numbers and which has functions for executing dialing of a telephone number which has been selected by the user from the telephone numbers stored in the directory storage means, comprising a telephone call frequency judgment means and a directory storage control means. The telephone call frequency judgment means judges whether or not frequency of telephone calls concerning a current telephone number, which have just been dialed by the user or informed via the telephone network, is higher than predetermined frequency. And the directory storage control means executes control concerning storage of the current telephone number in the directory of the directory storage means if the current telephone number has not been stored in the directory of the directory storage means yet and the

telephone call frequency judgment means judged that the frequency of telephone calls concerning the current telephone number is higher than the predetermined frequency.

The directory storage control means may inquire of the user whether or not the user intends to store the current telephone number in the directory of the directory storage means if the current telephone number has not been stored in the directory of the directory storage means yet and the telephone call frequency judgment means judged that the frequency of telephone calls concerning the current telephone number is higher than the predetermined frequency, and store the current telephone number in the directory of the directory storage means if the user requested to store the current telephone number.

Alternatively, the directory storage control means may store the current telephone number in the directory of the directory storage means if the current telephone number has not been stored in the directory of the directory storage means yet and the telephone call frequency judgment means judged that the frequency of the telephone calls concerning the current telephone number is higher than the predetermined frequency.

In accordance with a second aspect of the present invention, there is provided a directory dialing telephone set comprising directory storage means for storing a directory including a plurality of telephone numbers; means for executing dialing of a telephone number which has been selected by the user from the telephone numbers stored in the directory storage means;

telephone number temporary storage means for temporarily storing a predetermined number of telephone numbers which have been dialed by the user and telephone numbers of calling parties which have been informed via the telephone network;

counter means for counting the number of times a current telephone number, which has been dialed by the user or informed via the telephone network, has been stored in the telephone number temporary storage means;

searching means for searching the directory storage means for the current

telephone number and judging whether or not the current telephone number has already been stored in the directory of the directory storage means; and

directory storage control means for controlling storage of the current telephone number in the directory of the directory storage means if the number of times which has been counted by the counter means is larger than a predetermined threshold number and the searching means judges that the current telephone number has not been stored in the directory of the directory storage means.

The directory storage control means may inquire of the user whether or not the user intends to store the current telephone number in the directory of the directory storage means if the number of times which has been counted by the counter means is larger than a predetermined threshold number and the searching means judged that the current telephone number has not been stored in the directory of the directory storage means yet, and store the current telephone number in the directory of the directory storage means if the user requested to store the current telephone number.

Alternatively, the directory storage control means may store the current telephone number in the directory storage means if the number of times which has been counted by the counter means is larger than a predetermined threshold number and the searching means judged that the current telephone number has not been stored in the directory of the directory storage means yet.

In accordance with a third aspect of the present invention, there is provided a directory dialing telephone set comprising directory storage means for storing a directory including a plurality of telephone numbers; means for executing dialing of a telephone number which has been selected by the user from the telephone numbers stored in the directory storage means;

telephone number temporary storage means for temporarily storing telephone numbers which have been dialed by the user, telephone numbers of calling parties which have been informed via the telephone network, and time stamps concerning the telephone numbers;

update means for updating the telephone numbers and the time stamps stored in the telephone number temporary storage means so as to delete telephone numbers and the time stamps which have passed a predetermined period;

counter means for counting the number of time stamps concerning a current telephone number, which has just been dialed by the user or informed via the telephone network, that exist in the telephone number temporary storage means;

searching means for searching the directory storage means for the current telephone number and judging whether or not the current telephone number has already been stored in the directory of the directory storage means; and

directory storage control means for controlling storage of the current telephone number in the directory of the directory storage means if the number of time stamps which has been counted by the counter means is larger than a predetermined threshold number and the searching means judges that the current telephone number has not been stored in the directory of the directory storage means.

The directory storage control means may inquire of the user whether or not the user intends to store the current telephone number in the directory of the directory storage means if the number of time stamps which has been counted by the counter means is larger than a predetermined threshold number and the searching means judged that the current telephone number has not been stored in the directory of the directory storage means yet, and store the current telephone number in the directory of the directory storage means if the user requested to store the current telephone number.

Alternatively, the directory storage control means may store the current telephone number in the directory of the directory storage means if the number of time stamps which has been counted by the counter means is larger than a predetermined threshold number and the searching means

judged that the current telephone number has not been stored in the directory of the directory storage means yet.

Preferred features of the present invention will now be described, purely by way of example only, with reference to the accompanying drawings, in which:-

Fig.1 is a block diagram showing functional blocks of a directory dialing telephone set according to a first embodiment of the present invention concerning storage of telephone numbers;

Fig.2 is a flow chart showing the operation of the directory dialing telephone set of the first embodiment concerning storage of telephone numbers;

Fig.3 is a block diagram showing functional blocks of a directory dialing telephone set according to a second embodiment of the present invention concerning storage of telephone numbers; and

Fig.4 is a flow chart showing the operation of the directory dialing telephone set of the second embodiment concerning storage of telephone numbers.

Fig.1 is a block diagram showing functional blocks of a directory dialing telephone set according to a first embodiment of the present invention concerning storage of telephone numbers. The directory dialing telephone set of the first embodiment comprises a dialing section 1 composed of push buttons etc. for letting the user dial telephone numbers, a transmission section 2 for transmitting a telephone number which has

been dialed (pushed or selected) by the user into a telephone network, a reception section 3 for receiving a telephone number which has been informed by the telephone network according to a service such as "calling number identification presentation" etc., a signal processing section 4 for executing procedures concerning telephone numbers on calling and reception etc., a control section 5 for controlling components of the directory dialing telephone set, a telephone number temporary storage section 6 for temporarily storing telephone numbers which have been dialed by the user and telephone numbers of calling parties which have been informed by the telephone network, a counter section 7 for counting the number of calling and reception concerning a telephone number by referring to data stored in the telephone number temporary storage section 6, a display section 8 for displaying information such as a telephone number on calling or reception, an inquiry to the user, etc., a directory storage section 9 for storing a directory including a plurality of telephone numbers, a searching section 10 for searching the directory storage section 9, a directory storage control section 11 for executing control concerning storage of telephone numbers in the directory storage section 9, and a storage button 12 for receiving an instruction of the user to store the telephone number in the directory storage section 9.

The telephone number temporary storage section 6 of the first embodiment is designed to store a predetermined number (for example, 50, 100, etc.) of telephone numbers, and the oldest telephone number which has been stored in the telephone number temporary storage section 6 is deleted when a new telephone number is stored in the telephone number temporary storage section 6 according to FIFO (First-In First-Out) operation.

The telephone number temporary storage section 6 is realized by, for example, FIFO memory (pushup storage). The directory storage section 9 is realized by RAM (Random Access Memory), for example.

The display section 8 is realized by, for example, an LCD (Liquid Crystal Display). The signal processing section 4, the control section 5, the counter section 7, the searching section 10 and the directory storage control section 11 can be realized by, for example, a microprocessor unit which is composed of a CPU (Central Processing Unit), ROM (Read Only Memory), RAM, etc., and appropriate software.

In the following, the operation of the directory dialing telephone set according to the first embodiment of the present invention will be described. Fig.2 is a flow chart showing the operation of the directory dialing telephone set of the first embodiment concerning storage of telephone numbers.

Referring to Fig.2, when a call is done by the user by dialing a telephone number, the telephone number dialed by the user is supplied to the telephone number temporary storage section 6 via the control section 5. On the other hand, when reception of a call from a calling party occurred, the telephone number of the calling party which is informed by the telephone network according to "calling number identification presentation" etc. is supplied to the telephone number temporary storage section 6 via the reception section 3, the signal processing section 4 and the control section 5. The telephone number temporary storage section 6 which received the telephone number (hereafter, referred to as a "current telephone number") via the control section 5 stores the current telephone number. According to the storing operation, the oldest telephone number which has been stored in the telephone number temporary storage section 6 is deleted according to FIFO operation (step S1).

Subsequently, the counter section 7 reads out data in the telephone number temporary storage section 6 and counts the number of the "current telephone number"s which exist in the telephone number temporary storage section 6. In other words, the counter section 7 determines how many times the "current telephone number" has been

stored in the telephone number temporary storage section 6 within the predetermined capacity (50, 100, etc.) of the telephone number temporary storage section 6.   After the reading out, the status of the telephone number temporary storage section 6 is restored to the original status

5   before the reading out by the counter section 7 (The data read out from the telephone number temporary storage section 6 is restored in the telephone number temporary storage section 6 by the counter section 7) (step S2).

Subsequently, the control section 5 judges whether or not the

10   number of the current telephone numbers counted by the counter section 7 is larger than a predetermined threshold number T (step S3).   If the number of the current telephone numbers in the telephone number temporary storage section 6 is larger than the threshold number T, process proceeds to the next step S4, and otherwise, process is ended

15   without any further operation.

In the step S4, the searching section 10 searches the directory storage section 9 according to an instruction of the directory storage control section 11 and thereby judges whether or not the current telephone number has already been stored in the directory of the

20   directory storage section 9.   If the current telephone number has already been stored in the directory, process is ended.   If the current telephone number has not been stored in the directory yet, the directory storage control section 11 inquires of the user whether or not the user intends to store the current telephone number in the directory, by displaying an

25   inquiry message on the display section 8 (step S5).   If the user intended to store the current telephone number, the user pushes the storage button 12 and the current telephone number is stored in the directory of the directory storage section 9 (step S6).   If the used does not intend to store the current telephone number, the storage button 12 is not pushed and

30   process is ended without storing the current telephone number in the

directory.

As described above, in the directory dialing telephone set according to the first embodiment of the present invention, a telephone number dialed by the user for calling or a telephone number of the calling party which is informed by the telephone network according to a service such as calling number identification presentation etc. is stored one by one in the telephone number temporary storage section 6 which can store a predetermined number of telephone numbers. The number of the current telephone numbers that exist in the telephone number temporary storage section 6 is counted by the counter section 7, and the inquiry to the user (asking the user whether or not the user intends to store the current telephone number in the directory of the directory storage section 9) is executed only in the case where the number of the current telephone numbers stored in the telephone number temporary storage section 6 is larger than a predetermined threshold number T and the current telephone number has not been stored in the directory storage section 9 yet. The current telephone number is stored in the directory of the directory storage section 9 if the user requested to store the current telephone number by pushing the storage button 12.

The inquiry is not executed with regard to telephone numbers that are rarely dialed by the user nor with regard to telephone numbers of calling parties who rarely calls the directory dialing telephone set of the user. Therefore, the user is released from troublesome operation such as being inquired and pushing a button with regard to telephone numbers that will not be registered, and thus the user can register necessary telephone numbers in the directory of the directory storage section 9 efficiently and with a minimum of effort.

Incidentally, it is also possible to design the directory dialing telephone set of the first embodiment so that the user can also store the current telephone number in the directory of the directory storage section

9 even when the inquiry is not executed by the directory dialing telephone set, by pushing the storage button 12 etc.

Fig.3 is a block diagram showing functional blocks of a directory dialing telephone set according to a second embodiment of the present invention concerning storage of telephone numbers. The directory dialing telephone set of the second embodiment comprises a dialing section 1 composed of push buttons etc. for letting the user dial telephone numbers, a transmission section 2 for transmitting a telephone number which has been dialed (pushed or selected) by the user into the telephone network, a reception section 3 for receiving a telephone number which has been informed by the telephone network, a signal processing section 4 for executing procedures concerning telephone numbers on calling and reception etc., a control section 5A for controlling components of the directory dialing telephone set, a telephone number temporary storage section 6A for temporarily storing telephone numbers which have been dialed by the user and telephone numbers of calling parties which have been informed by the telephone network and time stamps (the date and time) concerning the telephone numbers, a counter section 7A for counting the number of time stamps concerning a telephone number by referring to the telephone number temporary storage section 6A, a display section 8 for displaying information such as a telephone number on calling or reception, an inquiry to the user, etc., a directory storage section 9 for storing a directory including a plurality of telephone numbers, a searching section 10 for searching the directory storage section 9, a directory storage control section 11 for executing control concerning storage of telephone numbers in the directory storage section 9, and a storage button 12 for receiving an instruction of the user to store the telephone number in the directory storage section 9.

The telephone number temporary storage section 6A of the second embodiment is designed to store a plurality of telephone numbers and

time stamps (the date and time) concerning each of the telephone numbers, during a predetermined period. The telephone numbers and the time stamps stored in the telephone number temporary storage section 6A is updated by the control section 5A periodically (once in a day, for example). In the update, time stamps which have passed the aforementioned predetermined period are deleted from the telephone number temporary storage section 6A, and telephone numbers whose latest time stamp has passed the aforementioned predetermined period are deleted from the telephone number temporary storage section 6A. In other words, the telephone number temporary storage section 6A stores time stamps which have not passed the aforementioned predetermined period since storing and telephone numbers whose latest time stamp has not passed the aforementioned predetermined period since storing.

The telephone number temporary storage section 6A and the directory storage section 9 are realized by RAM, for example. The signal processing section 4, the control section 5A, the counter section 7A, the searching section 10 and the directory storage control section 11 can be realized by, for example, a microprocessor unit which is composed of a CPU, ROM, RAM, etc., and appropriate software.

In the following, the operation of the directory dialing telephone set according to the second embodiment of the present invention will be described. Fig.4 is a flow chart showing the operation of the directory dialing telephone set of the second embodiment concerning storage of telephone numbers.

Referring to Fig.4, when a call is done by the user by dialing a telephone number, the telephone number dialed by the user (i.e. the current telephone number) is supplied to the control section 5A. On the other hand, when reception of a call from a calling party occurred, the telephone number of the calling party informed by the telephone network according to calling number identification presentation etc. (i.e. the

current telephone number) is supplied to the control section 5A via the reception section 3 and the signal processing section 4.

Subsequently, the counter section 7A refers to the telephone number temporary storage section 6A and judges whether or not the current telephone number exists in the telephone number temporary storage section 6A (step T1). If the current telephone number does not exist in the telephone number temporary storage section 6A, the control section 5A stores the current telephone number and a time stamp (the date and time) concerning the current telephone number in the telephone number temporary storage section 6A (step T2), and process is ended.

If the current telephone number exists in the telephone number temporary storage section 6A, the control section 5A stores a time stamp (the date and time) concerning the current telephone number in the telephone number temporary storage section 6A (step T3).

Subsequently, the counter section 7A refers to the telephone number temporary storage section 6A and counts the number of time stamps concerning the current telephone number which exist in the telephone number temporary storage section 6A. In other words, the counter section 7 determines how many telephone calls (calling and reception) concerning the current telephone number have been occurred during the aforementioned predetermined period (step T4).

Subsequently, the control section 5A judges whether or not the number of the time stamps counted by the counter section 7A is larger than a predetermined threshold number T (step T5). If the number of the time stamps counted by the counter section 7A is larger than the threshold number T, process proceeds to the next step T6, and otherwise, process is ended without any further operation.

In the step T6, the searching section 10 searches the directory storage section 9 according to an instruction of the directory storage control section 11 and thereby judges whether or not the current

telephone number has already been stored in the directory of the directory storage section 9. If the current telephone number has already been stored in the directory, process is ended. If the current telephone number has not been stored in the directory yet, the directory storage

5   control section 11 inquires of the user whether or not the user intends to store the current telephone number in the directory, by displaying an inquiry message on the display section 8 (step T7). If the user intended to store the current telephone number, the user pushes the storage button 12 and the current telephone number is stored in the directory of the

10   directory storage section 9 (step T8). If the used does not intend to store the current telephone number, the storage button 12 is not pushed and process is ended without storing the current telephone number in the directory.

As described above, in the directory dialing telephone set

15   according to the second embodiment of the present invention, a telephone number dialed by the user for calling or a telephone number of the calling party which is informed by the telephone network according to a service such as calling number identification presentation etc. (i.e. the current telephone number) and a time stamp concerning the current telephone

20   number are stored in the telephone number temporary storage section 6A and process is ended, if the current telephone number does not exist in the telephone number temporary storage section 6A, that is, if the current telephone number has not been stored in the telephone number temporary storage section 6A yet or the current telephone number has

25   been deleted from the telephone number temporary storage section 6A by the update of the telephone number temporary storage section 6A which is executed by the control section 5A. If the current telephone number existed in the telephone number temporary storage section 6A, a time stamp is added to the current telephone number stored in the telephone

30   number temporary storage section 6A. Storage of the time stamps in the

telephone number temporary storage section 6A can be executed according to any method that can at least link the time stamps with a corresponding telephone number. The number of the time stamps concerning the current telephone number which have been stored in the

5   telephone number temporary storage section 6A is counted by the counter section 7A, and the inquiry to the user (asking the user whether or not the user intends to store the current telephone number in the directory of the directory storage section 9) is executed only in the case where the number of the time stamps counted by the counter section 7A is larger

10 than a predetermined threshold number T and the current telephone number has not been stored in the directory storage section 9 yet. The current telephone number is stored in the directory of the directory storage section 9 if the user requested to store the current telephone number by pushing the storage button 12,

15   Therefore, the inquiry is not executed with regard to telephone numbers that are rarely dialed by the user nor with regard to telephone numbers of calling parties who rarely calls the directory dialing telephone set of the user. The user is released from the troublesome operation with regard to telephone numbers that will not be registered, and thus the

20 user can register necessary telephone numbers in the directory of the directory storage section 9 efficiently and with a minimum of effort, in the same way as the first embodiment.

       Incidentally, similarly to the first embodiment, it is also possible to design the directory dialing telephone set of the second embodiment so

25 that the user can also store the current telephone number in the directory of the directory storage section 9 even when the inquiry is not executed by the directory dialing telephone set, by pushing the storage button 12 etc.

       As set forth hereinabove, in the directory dialing telephone sets

                              the inquiry for asking the user

30 whether or not the user intends to store the current telephone number in

the directory is executed only in the case where telephone calls (calling and reception) concerning the current telephone number have been occurred more frequently than a predetermined frequency. Therefore, the user is released from the troublesome tasks such as being inquired

5   and pushing a button with regard to telephone numbers that will not be registered. The user can register necessary telephone numbers in the directory of the directory storage section efficiently and with a minimum of effort.

Incidentally, while the directory dialing telephone set described

10 above handled telephone numbers which are dialed by the user for calling and telephone numbers of calling parties which are informed by the telephone network (when the directory dialing telephone set of the user receives calls) according to a service such as calling number identification presentation etc., it is also possible to let the directory dialing telephone

15 set according to the present invention handle telephone numbers of calling parties which are informed (transmitted) by telephone sets of calling parties when the directory dialing telephone set of the user receives calls, telephone numbers of calling parties which are informed by the telephone network or telephone sets of calling parties during

20 conversation, etc., in the same way. Such telephone numbers of calling parties will be referred to as "telephone numbers informed via the telephone network" in the following claims.

In addition, while the directory storage control section 11 executed the inquiry to the user (asking the user whether or not the user intends to

25 store the current telephone number in the directory of the directory storage section 9) in the case where frequency of telephone calls (calling and reception) concerning the current telephone number is high and the current telephone number has not been stored in the directory storage section 9 yet, it is also possible to let the directory dialing telephone set

30 according to the present invention store the current telephone number

without executing the inquiry, after confirming that the frequency of telephone calls concerning the current telephone number is high and that the current telephone number has not been stored in the directory storage section 9 yet.

While the present invention has been described with reference to the particular illustrative embodiments, it is not to be restricted by those embodiments but only by the appended claims. It is to be appreciated that those skilled in the art can change or modify the embodiments without departing from the scope of the present invention.

Each feature disclosed in this specification (which term includes the claims) and/or shown in the drawings may be incorporated in the invention independently of other disclosed and/or illustrated features.

Statements in this specification of the "objects of the invention" relate to preferred embodiments of the invention, but not necessarily to all embodiments of the invention falling within the claims.

The description of the invention with reference to the drawings is by way of example only.

The text of the abstract filed herewith is repeated here as part of the specification.

A directory dialing telephone set, with which the user can register necessary telephone numbers in a directory of the directory dialing telephone set efficiently and with a minimum of effort, is presented. For example, a telephone number dialed by the user for calling or a telephone number of a calling party which is informed via the telephone network (i.e. a current telephone number) is stored one by one in a telephone number temporary storage section which can store a predetermined number of telephone numbers. The number of the current telephone numbers which exist in the telephone number temporary storage section is counted by a counter section, and inquiry to the user (asking the user whether or not the user intends to store the current telephone number in the directory which is provided in a directory storage section of the directory dialing telephone set) is executed only in the case where the number of the current telephone numbers stored in the telephone number temporary storage section is larger than a predetermined threshold number T and the current telephone number has not been stored in the directory storage section yet. The current telephone number is stored in the directory of the directory storage section if the user requested to store the current telephone number by pushing a storage button.

CLAIMS

1.   A directory dialing telephone set comprising directory storage means for storing a directory including a plurality of telephone numbers; means for executing dialing of a telephone number which has been selected by the user from the telephone numbers stored in the directory storage means;

telephone call frequency judgement means for judging the frequency of telephone calls made or received by the telephone set to or from a particular telephone number; and

directory storage control means for controlling storage of the telephone number in the directory storage means if the telephone number is not already stored therein and if the frequency of telephone calls to or from the telephone number is higher than a predetermined frequency.

2.   A directory dialing telephone set as claimed in Claim 1, wherein the directory storage control means inquires of the user whether or not the user intends to store the telephone number in the directory storage means if the telephone number has not been stored therein and the telephone call frequency judgment means judges that the frequency of telephone calls to or from the telephone number is higher than the predetermined frequency, and stores the current telephone number in the directory storage means if the user requests storage of the telephone number.

3.   A directory dialing telephone set as claimed in Claim 1, wherein the directory storage control means stores the telephone number in the directory storage means if the telephone number has not been stored therein and the telephone call frequency judgment means judges that the frequency of telephone calls to or from the telephone number is higher than the predetermined frequency.

4.   A directory dialing telephone set comprising directory storage means for storing a directory including a plurality of telephone numbers; means for executing dialing of a telephone number which has been selected by the user from the telephone numbers stored in the directory storage means;

telephone number temporary storage means for temporarily storing a predetermined number of telephone numbers which have been dialed by the user and telephone numbers of calling parties which have been informed via the telephone network;

counter means for counting the number of times a current telephone number, which has been dialed by the user or informed via the telephone network, has been stored in the telephone number temporary storage means;

searching means for searching the directory storage means for the current telephone number and judging whether or not the current telephone number has already been stored in the directory of the directory storage means; and

directory storage control means for controlling storage of the current telephone number in the directory of the directory storage means if the number of times which has been counted by the counter means is larger than a predetermined threshold number and the searching means judges that the current telephone number has not been stored in the directory of the directory storage means.

5.   A directory dialing telephone set as claimed in Claim 4, wherein the directory storage control means inquires of the user whether or not the user intends to store the current telephone number in the directory of the directory storage means if the number of times which has been counted by the counter means is larger than a predetermined threshold number and the searching means judges that the current telephone number has not been stored in the directory of

the directory storage means, and stores the current telephone number in the directory of the directory means if the user requests storage of the current telephone number.

6. A directory dialing telephone set as claimed in Claim 4, wherein the directory storage control means stores the current telephone number in the directory of the directory storage means if the number of times which has been counted by the counter means is larger than a predetermined threshold number and the searching means judges that the current telephone number has not been stored in the directory of the directory storage means.

7. A directory dialing telephone set comprising directory storage means for storing a directory including a plurality of telephone numbers; means for executing dialing of a telephone number which has been selected by the user from the telephone numbers stored in the directory storage means;

telephone number temporary storage means for temporarily storing telephone numbers which have been dialed by the user, telephone numbers of calling parties which have been informed via the telephone network, and time stamps concerning the telephone numbers;

update means for updating the telephone numbers and the time stamps stored in the telephone number temporary storage means so as to delete telephone numbers and the time stamps which have passed a predetermined period;

counter means for counting the number of time stamps concerning a current telephone number, which has just been dialed by the user or informed via the telephone network, that exist in the telephone number temporary storage means;

searching means for searching the directory storage means for the current telephone number and judging whether or not the current telephone number has already been stored in the directory of the directory storage means; and

directory storage control means for controlling storage of the current telephone number in the directory of the directory storage means if the number of time stamps which has been counted by the counter means is larger than a predetermined threshold number and the searching means judges that the current telephone number has not been stored in the directory of the directory storage means.

8.   A directory dialing telephone set as claimed in Claim 7, wherein the directory storage control means inquires of the user whether or not the user intends to store the current telephone number in the directory of the directory storage means if the number of time stamps which has been counted by the counter means is larger than a predetermined threshold number and the searching means judges that the current telephone number has not been stored in the directory of the directory storage means, and stores the current telephone number in the directory of the directory storage means if the user requests storage of the current telephone number.

9.   A directory dialing telephone set as claimed in Claim 7, wherein the directory storage control means stores the current telephone number in the directory storage means if the number of time stamps which has been counted by the counter means is larger than a predetermined threshold number and the searching means judges that the current telephone number has not been stored in the directory of the directory storage means.

10.   A directory dialing telephone set substantially as herein described with reference to the accompanying drawings.

INVESTOR IN PEOPLE

Application No: GB 9825377.6	**Examiner:** Jared Stokes
Claims searched: 1 to 10	**Date of search:** 25 March 1999

Patents Act 1977
Search Report under Section 17

Databases searched:

UK Patent Office collections, including GB, EP, WO & US patent specifications, in:

　　UK Cl (Ed.Q): H4K (KBNJ)

　　Int Cl (Ed.6): H04M (1/274, 1/57)

Other:　On-Line - WPI, EPODOC, PAJ

Documents considered to be relevant:

Category	Identity of document and relevant passage	Relevant to claims
A	EP 0 463 582 A2　(Rolm)　See column 4 lines 5-25	-
A	WO 98/27706 A1　(Northern)　See abstract	-

X	Document indicating lack of novelty or inventive step	A	Document indicating technological background and/or state of the art.
Y	Document indicating lack of inventive step if combined with one or more other documents of same category.	P	Document published on or after the declared priority date but before the filing date of this invention.
&	Member of the same patent family	E	Patent document published on or after, but with priority date earlier than, the filing date of this application.

An Executive Agency of the Department of Trade and Industry